REMARKS/ARGUMENTS

Applicants acknowledge receipt of the Office Action dated August 25, 2003. By virtue of this response, claims 21, 23-26, 28-31, 33-42, and 57 are pending, and claims 22, 27, and 32 have been cancelled. Claim 57 is newly added, and claims 21, 23, 26, 33, 34, 35, 37, 38 and 39 are currently amended. Please note that claim 21 is an independent claim. The Examiner has requested the Applicant to update the benefit claims in the application. In addition, the Examiner has objected to the title as allegedly not indicative of the invention to which the claims are directed. Claims 21-26 and 28-38 are rejected under 35 U.S.C. § 102 as being allegedly anticipated by Chen et al., U.S. Patent No. 6,518,156 ("*Chen*"); Edman et al., U.S. Patent No. 6,569,382 ("*Edman*"); or Heath et al., U.S. Patent No. 6,459,095 ("*Heath*"). In addition, claims 27 and 39-42 are rejected under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claims 1-7 of Tour et al., U.S. Patent No. 6,430,511 ("*Tour*"). The Examiner also objects to alleged informalities in the specification on page 15, line 24 and in claim 37. Applicants believe the pending claims are allowable over the art of record and respectfully request reconsideration.

I. The benefit claims are updated.

The Examiner has requested an update to the benefit claims of the present application. Applicants have amended the benefit claims in the "Cross Reference to Related Applications" to update the status of pending applications if such pending applications have become a patent or abandoned and to add serial numbers as needed.

II. The title is descriptive.

The Examiner has objected to the title as not descriptive because it is not allegedly indicative of the invention to which the claims are directed. Applicants have amended the title to a

"Method of Making a Nanoscale Electronic Component Comprising Programming with a Self-Adaptive Algorithm." Applicants therefore respectfully request the Examiner to remove the objection to the title.

III. Claims 21, 23-26, 28-31 and 33-38 are not anticipated by *Chen*, *Edman* or *Heath*.

Applicants respectfully traverse the Examiner's rejections of claims 21, 23-26, 28-31, and 33-38 as being allegedly anticipated by *Chen*, *Edman* or *Heath*. Claims 22 and 32 have been cancelled. Applicants submit that claims 21, 23-26, 28-31, and 33-38, as amended, are not anticipated by *Chen*, *Edman* or *Heath* because *Chen*, *Edman*, or *Heath* fail to disclose each and every limitation of these claims.

Claim 21 is an independent claim upon which claims 23-26, 28-31, and 33-38 are dependent. Claim 21 has been amended to recite a self-assembled nanocell comprising at least one input lead; at least one output lead; and a nano-network spanning the input lead and the output lead, wherein the nano-network comprises a random array of molecular circuit components, nanoscale components or the combination thereof and wherein programming the nanocell comprises applying a self-adaptive algorithm to reconfigure the molecular circuit components. Nothing in *Chen*, *Edman*, or *Heath* teaches or suggests a nano-network spanning the input lead and the output lead, wherein the nano-network comprises a random array of molecular circuit components, nanoscale components or the combination thereof. Nor does anything in *Chen*, *Edman* or *Heath* teach or suggest programming the nanocell comprising applying a self-adaptive algorithm to reconfigure the molecular circuit components.

Instead, *Chen* teaches a method for configuring nanoscale devices in a crossbar array of configurable devices wherein the method comprises changing a property of the configurable material to thereby configure the nanoscale devices (*Chen*, Abstract). The crossbar array of *Chen*

comprises cross-points of one layer of metal or semiconductive lines, or wires, crossed by a second layer of metal or semiconductive nanoscale lines, or wires, with a configurable layer between the lines (*Chen*, col. 1, lns. 51-55). Nothing in *Chen* teaches that the crossbar array may comprise a self-assembled nanocell comprising at least one input lead; at least one output lead; and a nano-network comprising a random array of molecular circuit components, nanoscale components or the combination thereof. Moreover, *Chen* defines self-assembled as a system that naturally adopts some geometric pattern because of the identity of the components of the system (*Chen*; col. 2, lns. 61-63). Nothing in *Chen* teaches or discloses that a self-assembled nanocell can comprise a random arrangement of molecular components. One skilled in the art would know that the geometric pattern of *Chen* suggests an ordered and regular arrangement that is not consistent with a random array of molecular circuit components.

Edman teaches a method and apparatus for the fabrication of micro-scale and nano-scale devices (*Edman*, Abstract). In particular, *Edman* discloses fabrication of devices comprising the steps of fabricating first component devices on a first support, releasing at least one first component device to a second support, and attaching the first component device to the second support (*Edman*; col. 7, lns. 10-14). *Edman* teaches that electrostatic and other forces may be employed to transport, position and orient components upon a suitably designed substrate (*Edman*; col. 7, lns. 15-17). As described by *Edman*, the unique properties of DNA provide a programmable recognition code, which can be used for *specific placement and alignment* of sub-micron and nanoscale structures (*Edman*; col. 15, lns. 15-18). *Edman* neither teaches nor suggests a method for fabricating nanoscale devices comprising providing a self-assembled nanocell having a nano-network comprising a random array of molecular circuit components. Such "specific placement and alignment" of *Edman* is not a random array. Moreover, *Edman* cites an advantage

of DNA polymers as providing a way to encode *highly specific* binding-site identities o[n] semiconductor or photonic surfaces and providing a way to specifically connect any of these locations (*Edman*; col. 12, lns. 16-24). Applicants' specification teaches that "the nanocell is programmable regardless of the precise arrangement of the molecular components" (Application; para. [0012]). Therefore, the "highly specific-binding identities and specific binding-site" teachings of *Edman* do not anticipate claim 21.

Moreover, *Heath* discloses a route to the fabrication of electronic devices in which the devices consist of two crossed wires sandwiching an electrically addressable molecular species (*Heath*; col. 2, lns. 14-17). The electrical tasks performed by the electronic devices taught by *Heath* are largely determined by the types of wires and interwire materials that are used (*Heath*; col. 4, lns. 38-40). Depending on the molecules or materials used between the wires, *Heath* teaches that each junction can either display the types of electrical function described immediately on contact of the wires or the junction can have a switching function that acts to connect or disconnect the two wires together electrically (*Heath*; cols. 4-5, lns. 64-2). *Heath* further teaches that its tasks can be utilized to form a useful device in any one of three ways. First, if at least one of the wires is a doped semiconductor, then resonant tunneling between the two wires through the electronic states of the molecules will form a resonant-tunneling diode. Second, if the redox pair can be reversibly oxidized or reduced, and if there is voltage hysteresis in the oxidation or reduction current/voltage scan, the device can form the basis for a random access memory element. Finally, if the redox pair can be irreversibly oxidized or reduced, the device forms the basis for a read-only memory element (*Heath*; col. 8, ln. 56 – col. 9, ln. 3). Such teachings of *Heath* do not disclose or suggest programming a nanocell wherein programming comprises applying a self-adaptive algorithm. One skilled in the art would know that merely connecting/disconnecting wires

to achieve electrical function as taught by *Heath* is markedly different than programming by applying a self-adaptive algorithm.

In view of the recitations in claim 21, as amended, that are neither taught nor suggested by *Chen*, *Edman*, or *Heath,* the Applicants respectfully request that the Examiner withdraw the §102 rejections and allow claim 21. Applicants further request that the Examiner also withdraw the § 102 rejections of dependent claims 23-26, 28-31, and 33-38 since it is submitted that independent claim 21, as amended, is allowable. Dependent claims 23-26, 28-31 and 33-38 must *a fortiori* also be allowable, since they carry with them all the limitations of the independent claim to which they ultimately refer.

IV. Claims 39-42 are not unpatentable over U.S. Patent No. 6,430,511 to *Tour* et al.

The Examiner rejected claims 27 and 39-42 under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claims 1-7 of *Tour*. Claim 27 has been canceled.

Please note that the present application and *Tour* are not commonly owned. Therefore, a terminal disclaimer is not applicable.

Claims 39-42 are dependent upon independent claim 21. The Examiner does not allege that independent claim 21 is rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-7 of *Tour*. Moreover, Applicants propound that independent claim 21 is not unpatentable over claims 1-7 of *Tour*.

Therefore, since claims 1-7 of *Tour* do not render independent claim 21 unpatentable, it is submitted that claims 39-42 are patentably distinct from claims 1-7 of *Tour*. Since independent claim 21 is allowable, dependent claims 39-42 must *a fortiori* also be allowable, since they carry with them all the limitations of independent claim 21.

V. Informalities have been corrected.

The Examiner has objected to the disclosure because of alleged informalities. The Examiner objects to the specification on page 15, line 24, because of a blank. In addition, the Examiner objects to claim 37 because a comma is allegedly missing in the phrase "Inverse Half-Adder a Multiplexer." Applicants have amended the specification on page 15, line 24, to fill in the blank and have amended claim 37 to add the comma. Applicants therefore respectfully request the Examiner to remove the objections to the disclosure.

In addition, Applicants have amended paragraphs 26, 27, 50, 52, 56 and 132 of the specification to correct minor typographical errors.

VI. New claim 57 is allowable.

New claim 57 is dependent upon independent claim 21. Since independent claim 21 is submitted to be allowable, dependent claim 57 must *a fortiori* also be allowable, since it carries all the limitations of independent claim 21. Therefore, it is submitted that all pending claims are in condition for allowance.

VII. Conclusion

In view of the foregoing remarks, Applicants believe that the pending claims are allowable and that the present application is now in full condition for allowance, which action Applicants earnestly solicit. If the Examiner has any questions or comments regarding the foregoing, the Examiner is requested to telephone the undersigned.

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when

determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art that have yet to be raised but that may be raised in the future.

If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,

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